18U125   (Pages: 2)   Name:……………………

Reg.No:…………………..

FIRST SEMESTER B.Sc. DEGREE EXAMINATION, NOVEMBER   2018
(Regular/supplementary/Improvement)

(CUCBCSS-UG)

CC17U BCA1 C01 - MATHEMATICAL FOUNDATIONS OF COMPUTER APPLICATIONS
(Mathematics - Complementary Course)

(2017 Admission onwards)

Time: Three Hours   Maximum: 80 Marks

I.   Answer *all* questions. Each question carries 1 mark.

   1. $(A^T)^T$ = ………..

   2. If two vectors $\vec{a}\, and\, \vec{b}$ are collinear, then $\vec{a} \times \vec{b}$ = ………..

   3. In Gauss Jordan method the coefficient matrix is transformed into ……….. matrix.

   4. Derivative of a constant is ………..

   5. A matrix of order 3 has ……….. Eigen values.

   6. For all the matrices determinant can be calculated. True or False?

   7. A matrix having only one column is called a ………..

   8. Differentiate $e^x sinx$

   9. $\int 5\, dy$ = ………..

   10. Evaluate $\int x\, logx\, dx$

(10 × 1 = 10 Marks)

II. Answer *all* questions. Each question carries 2 marks.

   11. Define dot product and cross product.

   12. If a matrix has 16 elements then what are the possible orders it can have?

   13. What do you mean by linear system of equations?

   14. Explain product rule in differentiation with one suitable example.

   15. Evaluate $\int_0^1 xe^x dx$

(5 × 2 = 10 Marks)

III. Answer any *five* questions. Each question carries 4 marks.

   16. Find the characteristic equation of the matrix $\begin{bmatrix} 2 & 7 \\ 7 & 2 \end{bmatrix}$

   17. Compare Gauss elimination and gauss Jordan methods.

   18. $\int sec\, x(sec\, x + tan\, x)\, dx$

19. Given A = $\begin{bmatrix} 4 & -3 & 0 \\ 0 & -1 & 1 \\ 2 & 0 & -1 \end{bmatrix}$ is the A singular or non-singular?

20. Find the rank of the given matrix A = $\begin{bmatrix} 1 & 2 & 1 \\ 2 & 3 & 1 \\ 1 & 1 & 0 \end{bmatrix}$

21. Find $\frac{dy}{dx}$ if $x^y = y^x$

22. Find $\vec{a} \times \vec{b}$ if $\vec{a} = 5\hat{\imath} + 6\hat{\jmath} - 3\hat{k}$ and $\vec{b} = -2\hat{\imath} + 4\hat{\jmath}$

23. $\int 8x^2(3x^3 - 1)^{16}dx$

(5 × 4 = 20 Marks)

IV. Answer any *five* questions. Each question carries 8 marks.

24. Evaluate $\int_1^2 \frac{\log(x+1)}{x+1} \, dx$

25. Let A = $\begin{bmatrix} 3 & 1 \\ -1 & 2 \end{bmatrix}$ Show that A²-5A+7I=0

26. Find the derivative of $\sin x$ using the method of first principle.

27. Consider the function $y = mx + c$ Find the value of y' (5)

28. Find X and Y, if $X + Y = \begin{bmatrix} 7 & 0 \\ 2 & 5 \end{bmatrix}$ and $X - Y = \begin{bmatrix} 3 & 0 \\ 0 & 3 \end{bmatrix}$

29. Explain angle between two vectors in vector analysis.

30. Solve the system of equations using Gauss elimination method

$$5x + 2y = 2$$
$$2x + y - z = 0$$
$$2x + 3y - z = 3$$

31. Find $\frac{dy}{dx}$, if $y = \frac{x^2+5x+7}{x^{\frac{1}{2}}}$

(5 × 8 = 40 Marks)

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